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DEPARTMENT OF HEALTH  
Division Narcotic Drug Control

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BOOKLET  
ON  
MARIHUANA



HARRISBURG, PA.  
1938

P 38.4  
12 mb.



# MARIHUANA

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Abstracts of speaker's remarks at a "Symposium on Marihuana,"  
arranged by John H. Remig, M. D., and held on  
March 28, 1938, at the Temple University  
School of Pharmacy



Leaf,  $\times 0.5$

Vein structure is more readily observed on the under side of leaves

## TOXIC EFFECTS OF MARIHUANA

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In the United States, Marihuana is for the most part consumed as cigarettes—"reefers." The extent of marihuana's action depends upon the potency of the plant, care in curing the product, individual susceptibility and the quantity consumed. Two "reefers" are often sufficient to confer the desired effect and the smoke which is always inhaled, is retained a long time. Soon the smoker is aware of increased power and energy, and sometimes is enabled to recall things long forgotten. Often there is excitement, with ideas becoming disconnected, and the smoker realizes his thoughts and actions are under less control. If at this stage the smoking is discontinued, the effect will gradually subside. Any sudden fright tends to restore the mental equilibrium. Were it desirable to come rapidly out of such a "drunk," fresh air and a cold bath will accomplish it. Often there is a state of delirium with the seeing and hearing of imaginary things. The faces of others may assume grotesque expressions and surrounding objects change their form. A lengthening of time and distance is usually experienced, which would be disastrous if the smoker were driving a car. Sometime there is a prolonged insomnia with delusions of persecution taking possession of the smoker, causing a violent, assaultive outbreak. Under proper treatment, such an acute attack is recoverable. But after preparations of marihuana have been smoked, chewed or drunk in large quantities for a long time, the addict is left with some degree of permanent mental impairment. These addicts become lazy, over-talkative, irritable, generally unreliable, may insult their friends, and any slight excess of the drug brings out a definite insanity, all ending in an incurable dementia. In its relation to crime, the danger from marihuana is similar to that from alcohol, neither being directly a producer of crime. Such offenses as may result, arise through a decrease in the smoker's self-control, so that harmful tendencies usually held in check, become active through the lessening of inhibition, that is, the power of restraint, or, in other words, "the brakes are off."



## PHARMACOLOGY AND TOXICOLOGY OF MARIHUANA

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Passage of H. R. 6906, the "Marihuana Tax Act" of 1937, and its signature by President Roosevelt, August 2nd, 1937, has focused attention on the Chemistry, Pharmacology and Toxicology of Marihuana. This discussion is an attempt to present our findings, since we began this study in 1934.

Administered to animals, swallowed or smoked by humans, similar effects may be observed. The nature of the response differs greatly with different animals or humans. The effect is principally exerted on the brain, and practically no reactions have been observed upon other parts of the body. The difference in response of different animals or humans, may be related to differences in their brain action. In general, the first response of humans is a feeling of happiness and intellectual stimulation, which is the result of depression of the inhibitory centers in the brain (alcohol is a depressant of these same inhibitory centers, and is not a stimulant). This stage is followed by that of color distortion: objects have varied hues and shades of color, from purple to violet to red, yellow, green, etc. The colors continually shift to any object. Associated with this are definite illusions regarding time and space. Usually time is shortened and space is lengthened, although some addicts show the opposite changes. Under the influence of the drug, the user can step from Philadelphia to the Panama Canal in three strides—he thinks, and does this within one second. Distortion of musical sounds is often observed at this time. Many addicts begin to develop the horrible rather than the pleasant responses at this stage.

With the larger doses, or in individuals with less sense of social responsibility, lack of inhibitions may lead to sex crimes, murder or other crimes. The subject usually is unaware of the criminal nature of the deeds contemplated, but feels that they are proper because he has thought of doing them. Various hallucinations develop. With dogs, very marked lack of coordination is manifest. This stage is followed by deep sleep. On awakening the human addicts may or may not remember their actions while under the influence of the drug.

With continued use, animals may develop a definite tolerance, so that larger doses are required to produce the same degrees of effect. With long continued usage, degeneration of the brain of animals seems to result. On the other hand the acute toxicity is low; that is, I have not been able to find any record of death of animals or men following the administration of any single dose of Marihuana.

The seed of the plant (Hemp seed) contain two different active

principles, one stimulating and the other depressing both mice and horses. The typical effects of the leaves are depressant.

The principle uses of Marihuana have been for effects on the brain in patients with rabies or tetanus, and to furnish a green color for corn cures. There are better drugs for each of these uses, so the legitimate pharmaceutical use of Marihuana is very slight.

Marihuana leaves may be recognized under the microscope by the presence of (1) short curving hairs, usually with cystoliths of calcium carbonate at the base, on the upper surface; (2) effervescence of these cystoliths following the application of a drop of concentrated hydrochloric acid; (3) long sharp tipped hairs on the lower surface and (4) the presence of the active resin at the base of the glandular hairs. Chemically various tests have been studied with the hope of developing a characteristic color reaction. We reported last year that the alkaline and the acid Beam tests were not absolutely safe and did not agree with bioassays on samples of Cannabis leaf. A modified alkaline test was proposed (American Association for the Advancement of Science, Atlantic City, N. J., December 28, 1936), which was an improvement over the previous alkaline tests. The details of this will be furnished on request. The reaction depends upon the extraction of a substance with petroleum ether, which reacts with an alcoholic solution of potassium hydroxide to give a violet color. A more characteristic test has been developed very recently. A solution of paradimethylaminobenzaldehyde in sulphuric or phosphoric acid gives a blue color, shifting to indigo and violet, on addition of a drop of water. Thus far no drug has been found which resembles marihuana in this reaction, with the exception of ergot, and it can be readily distinguished by various means. This test is being studied further with the hope of developing a portable kit for use by interested enforcement officials to aid in the positive identification of marihuana.

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The above articles on Marihuana were prepared especially for the Division of Drug Control, Pennsylvania Department of Health.

Prosecutions under the Pennsylvania Anti-Narcotic Act, (The Act of July 11, 1917, as amended, May 22, 1933, to include Marihuana) for sale or possession of Marihuana, is defined in Section IV of this Act. Addiction cases should be prosecuted under Section V.

Since the passage of this Act four defendants were fined and sentenced to jail in the Chester County Court, where Marihuana was found growing on their premises.

Three defendants were recently arrested at Bethlehem, Pennsylvania, for having Marihuana growing on their premises. They were held to await the action of the Grand Jury.

M. V. McFADDEN, *Chief,*

Pennsylvania Division of Narcotic Drug Control.

# MARIHUANA

(Official Mexican Name for Cannabis Sativa, L.)

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## PHARMACOGNOSY

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The natural habitat of Cannabis Sativa, L. Family Moraceæ, is Asia. Its spread and cultivation to and through other countries like the United States, Africa, India, Europe and Brazil may be traced to sweepings from ships that carried cargoes of hemp and other seeds.

The seeds deposited on the shores of various rivers, germinated and as crop succeeded crop new seeds were naturally carried farther inland.

Later, when man began to recognize its potentialities, regular plantings were made until to date Cannabis may be found in almost every state of the Union either in its wild state or under cultivation.

## CHARACTERISTICS

The plant is a tall, roughish, annual, dioecious herb with an angular stem, attaining a height of from one to five meters, depending upon well-fertilized soil for maximum growth and upon other environmental conditions for its pharmacological activity.

The leaves consist of from five to seven, serrate, linear-lanceolate leaflets, palmately-compound in formation. Axillary panicles of flowers are present toward the apex of the male or staminate plant, while catkins or dense clusters feature the apical and surrounding regions of the pistillate or female plant.

Viewed side by side, and when of equal height, more palmately-compound leaves are present on the female plant than on the male plant.

The axillary panicles of greenish colored flowers on the male plant are loosely arranged giving the flowers a somewhat pendulous appearance while the catkins plus bracts and smaller leaves form dense clusters on the female plant producing a somewhat top heavy appearance.

The male plant dies after pollination takes place. Under cultivation the male plant is removed either just before or directly after pollination depending upon whether the main crop is to be used for seed, fibre or resin production. Hence the leaves of very few if any staminate plants find their way into commerce.



Two commercial varieties of Cannabis are generally available viz., Indian Cannabis and American Cannabis. Both are from the plant Cannabis sativa, L., differing only in physical appearance. Indian Cannabis is prepared for the market by rolling and crushing the plants in such a way that the resinous material agglutinates and is scraped off and kneaded into the familiar flattened masses offered for sale. The American Cannabis is available in the form of leaves and smaller stems, plus the flowering and sometimes fruiting tops.

#### IDENTIFICATION

To the experienced, Cannabis is easy to identify in its fresh or dried, crushed or crumbled condition by the two organoleptic tests of sight and touch. Cannabis leaves have a "coarse" or "rough" feel due to numerous single-celled, sharply pointed trichomes or hair present on both surfaces of the leaves.

In the lumen toward the base of each hair, an irregular shaped crystal of calcium carbonate is present. Its presence therefore denotes this particular type of hair as "Cystolith Hair." A rapid, sure fire, field test consists of crushing the suspected material, placing in a small watch crystal, then adding a few drops of Acetic Acid or Dilute Hydrochloric Acid. If Cannabis is present a copious supply of carbon dioxide bubbles will appear in and around the leaf fragments. This effervescence may be observed with a not too expensive hand lens. A microscopic examination should be used as the confirmatory test.

(COMPILER'S NOTE: Some leaves have nine and eleven leaflets.)



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